SYNOPSIS

ON

Study on Impact of Odisha Millet Mission on household food and nutrition security in Dhenkanal district

For

Registration In Ph.D.

For the

Degree of Doctor of Philosophy

In

Home Science

From

Faculty of Social Sciences

Ranchi University, Ranchi

Name of the Supervisor

Dr. Kiran Kumari

Associate professor

P.G. Dept. of Home Science,

Ranchi University, Ranchi

Name of candidate

Susrita Sahu

(Research Scholar)

State of the art–. India is now emerging as a key player on the global economic stage. The upward trajectory of Indian economy is now driven by technological transformation. Despite robust economic growth & achievement, the poverty landscape of India is very complex with millions of its population are still grappling for Food and nutrition security. India is positioned in 68th rank among 113 countries as per the report of the 11th Global food security Index,2022. According to report of The State of Food Security and Nutrition in the World,2024, The prevalence of undernourishment in India is 13.7 % (FAO,2024). The Sustainable Development Goal 2has focused on zero hunger with food and nutrition security by 2030 (UN, 2015).

Food security is a condition when all people have physical, social, and economic access to sufficient, safe, and nutritious food at all times that meets dietary needs and food preferences for an active and healthy life. (FAO. 2001) The four pillars of food security have been stated as availability, accessibility, utilization and stability. Food access is guaranteed when every household and individual within those households have enough resources to obtain the necessary foods for a healthy and nutritious diet. (Riely et al., 1995). Food security is a condition when all people have physical, social, and economic access to sufficient, safe, and nutritious food at all times that meets dietary needs and food preferences for an active and healthy life. (FAO. 2001) Food security affects physical, economic, environmental, and social life. It means just not availability but also access; justnot production but also process; just not technology, but also implementation; just not global balance, but also natural conditions; just not indictive figures, but also household realities; just not rural but also urban consumption; and justnot quantity of food but also quality.

Nutrition is the scientific study of nutrients in food, the utilization process of nutrients, and the connection between diet, health and diseases. Nutrition also explores how a healthy diet can prevent and alleviate various diseases and conditions such as malnutrition, food allergies, and intolerances (Newman, T.,2017). A deficiency in essential nutrients give rise to innumerous physical and mental disorders in humans. It

inhibits children's development into productive members of society and prevents adults from reaching their full potential in social and economic growth. Therefore, proper nutrition is vital for sustaining life for today & tomorrow. (National Institute of Agricultural Extension Management, 2014). Food security refers to have sufficient food available for all at all times for maintaining an active and healthy life. This concept of adequate food encompasses both the quantity and quality required to maintain good health (Haddad et al.,1994). A person is regarded as nutrition secure when he or she has access to a diet that meets the nutritional needs, and the food is effectively utilized in the body to maintain proper growth, to recover or resist from disease, to supply the needs for pregnancy, lactation, and physical activity (Frankenberger et.al. 1997), Inappropriate dietary pattern can lead to Food & nutrition insecurity resulting in malnutrition which is remains as a significant global health issue.

In this context to combat malnutrition, the ancient grains Millets which have been considered as a conventional diet of a part of Asian and African countries (Patil,2016), provide a promising solution owing to its richness in many essential nutrients There are eight types of millets species such as sorghum, finger millet, foxtail millet, pearl millet, little millet, kodo millet, barnyard millet, and proso millet are grown commonly in India under rain fed areas of semi-arid regions(Madhusudhana et al. 2017). These hardy crops are packed with 7-12 % protein, 2-5% per cent fat, 65-75 % carbohydrates and 15-20 % dietary fiber with vitamins like such as thiamine, riboflavin, folic acid, and niacin and minerals like iron, calcium, and magnesium, which are vital for overall health. They also come under low glycemic index & gluten-free food. (OMM,2020). Millets are nutritionally superior to major cereals in terms of calorific value, proteins, fat and minerals. They are also good sources of phytochemicals (phenolic acids, lignans and phytoestrogens), Phenolic acids (p – coumaric acid and vanillic acids) that are present in the bran layer of the grains (Qureshi et al. 2000). Little millet rice has been proved as a better diet in management of diabetes and associated cardiovascular related problems due to its low glycemic index (47.23) in compared to rice (71.87), (Stefano et al., 2015).

Besides the nutrition value, Millets are popularly known as climate resilient crop and can be grown in poor soil conditions with less water and critical inputs such as fertilizer &pesticides.Millets are termed as the most suitable crop for food security due to their sustainability in the adverse situation (Usha kumari et al. 2004).

Hence Government of Odisha launched a flagship Programme to promote millet cultivation and consumption through Dept. of Agriculture & farmers Empowerment in 2017 which is popularly `known as Odisha Millets Mission / Shree Anna Ahijan for strengthening the economic & nutrition security. Earlier to revive the millet cultivation in in rainfed areas., the Special Programme for the Promotion of Millets in Tribal Areas of Odisha was introduced in 2012 under the collaberation of Revitalizing Rainfed Agriculture Network (RRAN) with Watershed Support Services and Activities Network (WASSAN) prior to the launch of Odisha Millet Mission (OMM), At the initial stage, The Odisha Millet Mission was initiated with a coverage of 30 blocks of seven districts. Further the operational area has been extended to 177 blocks of all the districts of Odisha in 2022-n23(OMM,2023). The major objectives of this programme are increasing the productivity, encouraging the household level consumption, establishment up decentralized Processing facilities, promoting Farmer Collectives and Marketing and supplementation of millets intake in supplementary nutrition programme & public distribution system. Odisha has been conferred with the Best millet promoting state under ‘Poshak Anaj Award’ by the collaboration of ICAR-IIMR and FAO of the United Nations for its significant contribution in reviving the production & consumption of millets in the international Year of millet 2023. Under this programme, the Dhenkanal district which is Centrally located on the Geo-Political map of Odisha, and surrounded by beautiful wild lives and forests has been added in the year 2022-23 by covering five blocks.

Maxwell et.al. (1992) -Conceptualized the food security as a secure access to enough food at all times. Their definition was based on four key concepts which are sufficiency, temporal consideration access and security in availing the food.

Brown (1988) – This article reviewed the global food situation and its future prospects. He highlighted that a recent decrease in the world's food resources. The attributes for this decline is a combination of factors which includes increasing demand driven by population growth and a reduction in food supply was affected by monsoon failure in India and droughts in China and North America leading to lower harvests .

Norse (1994) – The study emphasized that environmental, economic, population, and climate change are all the key threats which influence the regional food security. These factors need not to be come at a time in a consistent manner. He points out that Sub-Saharan Africa is the most vulnerable region, where current food insecurity is primarily due to issues related to purchasing power and political challenges. In contrary, the potential impacts of climate change is a reason for mid-21st century. Similarly, despite current food surplus in Asia, many vulnerable groups in the region still face food insecurity due to lack non-availability of land or financial resources.

Dresrusse (1996)- This paper described that food security could be assessed using traditional demand and supply equations. On the demand side, he placed population growth, per capita food consumption, and income elasticity, while on the supply side, he considered access to land, crop yield, and marketing costs. Based on his analysis, he concluded that prioritizing agricultural research is essential for achieving food security.

Frankenberger et.al. (1999) – This research explained the relation between livelihood security with household food security. They defined it as basic needs could be met by having enough and sustainable access to income and resources. This includes not only sufficient access to food but also clean water, education, social integration, community involvement, healthcare, and adequate housing.Food security affects physical, economic, environmental, and social life.

Kumbhareet al. (2013)-This study revealed the different dimensions of household food security. The food security status of the rural household was found to be low because of small and marginal land holding, poor agricultural productivity by environmental

changes, less involvement in subsidiary occupation and soar price of food & other commodities. It was also found that the various important attributes such as annual income, food quality, adoption of improved technology and participation in social activities have a positive impact on the household food security.

Upadhyay et al. (2011)-This review stated that the sole reasons for food insecurity are based on 3 concepts -. 'Traditional concept' which encompasses the elements like of food unavailability and poor purchasing powers whereas Socio demographic concept' lies with illiteracy, unemployment, overcrowding, poor environmental conditions and gender bias; & 'politico-developmental concept' involves with poor intersectoral coordination & political will, weak monitoring of nutritional programmes and poor management of public food distribution system.

Rahman et al. (2019)-This research stated that the three pillars of food security are availability, accessibility and absorption. Food availability could be ensured through self-sufficiency in food production. The shifting from a staple grain-focused system to a diversified agricultural production system requires remarkable reforms in the procurement, stocking, and distribution processes. To achieve this, food security, programs must emphasize improved nutrition within food and agricultural policies by promoting nutrition-sensitive food systems. The study also revealed that the states having an improved agricultural system with public provision of health and hygiene perform much better on the nutritional outcomes. It also laid emphasis on promotion diversified agricultural systems with inclusion of horticulture and livestock sector for small holder& addition of coarse cereals and pulses in the PDS for diversified diets and production of these nutritive crops.

Naveena et al. (2016)-stated that millets are packed with micronutrients that help in addressing various diseases& disorders related to nutrients and offer an affordable food source for a large section of the population. Their value is especially significant in poor or rocky soils and regions with low or irregular rainfall due to their strong, deep root systems and efficient water usage. Some millets also sustain in harsh climatic conditions.

Sarita et al. (2016)-made a study on the potential of millets briefing that these grains are valued both as food and for therapeutic purposes. These are also rich in antioxidants like flavonoids and phenolic acids, which contribute to health benefits. These are considered as prebiotics, which can support and enhance the effectiveness of probiotics in the digestive system.

Chaudhary et al. (2023)-The study reviewed the area, production, and productivity trends of jowar, bajra, ragi, and small millets across India. The leading producers for these crops are -Uttarakhand for small millets, Maharashtra for jowar, Rajasthan for bajra, and Karnataka for ragi. there has been a significant decline in the area under cultivation for these crops in between 1950- 2021, with Compound Annual Growth Rates (CAGR) of -3.60% for small millets, -1.86% for jowar, -1.27% for bajra, and -0.60% for ragi. The production of small millets and jowar has been declining each yearwith annual rate of 2.89% and 0.63%, respectively. On the other hand, bajra production has seen a slight annual increase of 0.12%.

Patel et al. (2014)-. The findings of the paper is that limited use of millets in the regions where they are cultivated is primarily ascribed to lack of awareness about their nutritional benefits and properties. Despite their traditional farming practices, the decline in millet consumption is due to the unavailability of processed millet products leading to a decrease in recognition among people who once regularly consumed them.

Srividhya (2016)-She carried a study on small millet consumption and found that awareness and consumption of these millets are significantly influenced by the factors such as income age & availability of millets Individuals aged 25 to 35 were particularly knowledgeable about the benefits of small millets and consumed these more frequently compared to other age groups. The study also highlighted that people buy and consume small millets mainly for the economic benefits of cultivation & for being a climate resilient crop for ensuring food, nutrition, and fodder security. Additionally, millets are used for their health benefits, such as lowering cholesterol and aiding weight

management without adverse effects, and they are often recommended as a healthy diet choice.

Anubha et al. (2015)- Theyconducted a study on pearl and finger millets, highlighting their potential role in ensuring food security. one of the main reasons for the lower production of millets is the perception that their cultivation is labor-intensive. However, the fact is that that millets have significant potential to meet the growing demand for nutritious food. Therefore, the study emphasized the need for commitment and effective strategies to promote these crops, encouraging greater investment and cultivation.

Sendhilet al.` (2023)-The study emphasized that Outreach programs and activities are essential for ensuring sustainable growth in millet production, consumption, and trade. These initiatives include publicity campaigns, outdoor promotions, awareness activities, and capacity-building programs tailored for farmers, consumers, traders & processors. These efforts are vital to fostering widespread adoption and understanding of millets. With ongoing promotion and support, nutrient-rich millets have the potential to significantly enhance India's food and nutrition security through sustainable agriculture & improving public health.

Patnaiket al. (2024)- The data analysis revealed that farmers who participated in the Odisha Millet Mission performed better than those who did not. The study highlighted that the mission helps in upgrading the knowledge level, increasing adoption rate of improved practices, revamping the productivity, raising the annual income, and enhancing the social participation among recipient farmers. In this way, the OMM contributed to the overall well-being of these farmers by positively impacting various aspects of their agricultural practices and socioeconomic conditions. The study recommended that mission's success is further affirmed by the Indian government's support and to implement similar initiatives in other states.

Problem to be investigated-

The aim of this proposed doctoral research is to study the impact of Odisha millet mission programme in achieving the food & nutrition security of the habitats in Dhenkanal district, Odisha. The research work will focus on assessing how this programme is beneficial for ensuring the accessibility & affordability of households towards inclusion of millet in their consumption pattern with upgradation profile of their nutritional status. This will also identify the critical issues related to the hinderance factor such as getting of good quality millet grains, instant millet powder, marketability of value added millet products, lack of awareness on importance of millet in diet and explore the different solutions for the successful implantation of the odisha millet mission programme towards enhancing the nutritional status of the community .

Objectives of the study-

1. To assess the factors influencing millet consumption.
2. To study the effectiveness of the OMM programme in the consumption pattern of the households.
3. To assess the impact of OMM on nutritional status of the community.
4. To identify the critical hinderance factors affecting the successful implementation of the programme.

Motivation- The Odisha Millet Mission program me is playing a vital role in promotion, production and consumption of millets in a holistic manner. The objective of the programme is to provide food security, nutrition security, economic security and social security to all. This program me is also aimed at sustainable agriculture by adopting these traditionally inherited & climate resilient crops. It has also focused on reducing the environment pollution as the millet require low amounts of fertilizer & pesticides in compared to other crops. This program me is also emphasized on strengthening the national economy by creating self-employment opportunity through production and marketing of raw and value-addedproducts.

So, combination of all these attributes motivate me in a higher extent to work on this topic.

Hypothesis

1. Odisha Millet Mission has improved the dietary habits of the household.
2. The nutritional status of the household is positively influenced by implementation of Odish Millet Mission.

Research question

1. What are the factors influencing the millet consumption in Dhenkanal district?
2. How does the Odisha millet mission programme helps in improving the dietary pattern of the households?
3. How does the Odisha millet mission programme enhance the nutritional status of the locals?
4. What are the challenges for the successful implementation of the programme?

Research design & methodology

- **Selection of the area**-Rural & urban area of the Dhenkanal district, odisha.
- **Type of study-** A combined-method approach may be fruitful for assessing the impact of Odisha millet mission on household food and nutrition security in Dhenkanal district. In this research, both quantitative data (performance indicator, survey) and qualitative data (interview, observations) will be measured for obtaining a greater accuracy & thorough understanding of the impact and effectiveness of the programme.

- **Sampling**-The sample size will be 300. Samples will be selected by purposive sampling method.

Particular Details	Blocks included under OMM (5 blocks)	Blocks excluded under OMM (3 blocks)
No. of the Blocks under study	2	1
Size of the sample	150	150

- **Variables-**

  Independent variables- caste, type of family, Education, income, health status, land holding

  Dependent variables- production, Nutritional knowledge, millet consumption frequency, amount of consumed millets, nutritional value of the millets,

- **Sources of Data**- Data collection will be done from primary as well as the secondary sources .

  Primary Data- These data will be collected by the help of a structured interview schedule & observation method.

  Secondary Data- These data will also be brought from FPO members, NGO personnel, SHG members, Producer group members, training manuals, registers, annual reports, books, journals, newspaper, social media etc. In addition to these comprehensive materials covering various aspects of food & nutrition security will also be used.

- **Data Analysis-**The data will be analyzed by using both descriptive and inferential statistics to understand the variables affecting the food & nutrition security. All relevant information will be organized in tables and visualized with graphs and diagram as per the need. All the relevant information will be tabulated, and descriptive statistics such as percentage, means, ranges, standard deviation and chi-square test will be used.

Significance of the study,-

Food is one of the basic necessities of human life. However, in current food trend, the consumption of well-known smart food or millets is a point of consumer attraction for their multi-dimensional health & nutritional benefits. In addition to this these are considered as climate resilient crops which aids in ensuring food & financial security. So the production & consumption of the traditional ancient

grain millets are once again promoted & popularized through Govt. schemes & programme. In context to this, the initiatives by Odisha Millet Mission are commendable. So this study will assess the degree of effectiveness of the programme .

Relevance of the study to the present-day problem-

Food & nutrition security is always being a matter of great concern throughout the world. The millets which are known as Nutri -cereals, play a crucial role in ensuring food & nutrition security. This is due to their adaptiveness in changing climate caused by global warming and rich in many nutrients. Thus, the promotion of millet production & consumption is highly essential. It can be achieved by by effective govt. interventions. With regards to this, contributions of Odisha millet mission for reviving of millets from ancient age to current age are signifiable. so here the study is crucial to measure the exact degree of effectiveness of this flagship programme.

Contribution to the existing knowledge- To the best my knowledge, no previous research has been done on Impact study of Odisha millet mission on household food and nutrition security in Dhenkanal district . This study would be a modest approach towards exploring the effectiveness of the Odisha millet mission programme on dietary pattern &nutritional status & nutrition security The study would also help to identifying the constraining factors & draw a conclusion on necessary strategies may be made for the successful implementation of the programme.

Future work-This type of study may also be conducted on Odisha millet mission on household food and nutrition security in other districts of Odisha as the production & consumption are also influenced by the difference in geographical area, culture, traditions consumer preference etc. These findings will be used for

redesigning or modifying the existing strategies in the govt. policy for successful implementation of the programme.

Limitations: - 1. The study will be limited to Dhenkanal district only.

2. The data will be conducted from those respondents who are voluntarily interested in this study

References: -

Brown, Lester R. (1988). The changing world food prospect: The nineties and beyond. World watch Paper 85, Washington, DC.

Chaudhary,J., Shelar R., Thakur ,K. Singh,R. and Rimpika (2023).Millets in India: Production, Consumption and Impact on Food Security. Asian Journal of Agricultural Extension, Economics & Sociology 41(8), 151-162,

David Norse (1994). Multiple Threats to Regional Food production: Environment, Economy, Population. Food Policy, 19(2), 146.

Dresrusse, G. (1996). Perspective of World Food Supply and Demand: Challenges and New Focusses. Agriculture and Rural Development, 5(2), 3-9.

FAO (2001). The state of Food Insecurity in the World 2001. Rome

FAO (2024). FAO hunger map2021-23 in "The state of food security & nutrition in the world"

Frankenberger, T. R.& Mc Caston, M. K. (1999). The Household Livelihood security Concept. Food and Nutrition and Agriculture, 22, 30-35.

Frankenberger, T. R., Oshaug, A., & Smith, L. (1997). A definition of Nutrition Security CARE memo. CARE, Atlanta, GA.

Haddad, L., E. Kennedy, & Joan Sullivan (1994). Choice of Indicators for Food Security and Nutrition Monitoring. Food Policy, 19 (3), pp. 329-343.

Kumbhare, N., Hansra, B., Kalantri, L., and Padaria, R. (2014). Household Food Security in Vidarbha Region of Maharashtra, India. International J. of Exten. Edu. 10, 168-175.

Madhusudhana, R., Padmaja, P.G., Cheruku, D., Rao, K.R. &Tonapi, V.A.(2018).ICAR-IIMR Millets Annual Report 2017-18

Maxwell S. and Frankenberger T. (1992). Household food security: Concepts, indicators, measurements: A technical review. IFAD/UNICEF, Rome, Italy.

National Institute of Agricultural Extension Management, (2014). Training Program on Food and Nutrition Security of Women in Agriculture. [Available at ttps://www.manage.gov.in/studymaterial/FNS-E.pdf] accessed on 29 august 2024].

Naveena, K.P., S.M. Mouzam, and V. Bellundagi. (2016). Economic Importance and Consumer Preferences for Neglected and Underutilized Crop Species in Karnataka. Economic Affairs, 61(1),135.

Newman, T. (2017). Nutrition: What is it and why is it important? Medical News Today. [.php Available on https3/160774, Accessed on 29 August 2024].

Odisha Millet Mission annual report 2019-20

Odisha Millet Mission annual report 2022-23

Patel, S., R.K. Naik, Sahu, R. and Nag. S. K. (2014). Entrepreneurship Development Through Finger Millet Processing for Better Livelihood in Production Catchment. American International Journal of Research in Humanities, Arts and Social Sciences, 8(2): 223– 227.

Patil JV (2016.ed.).Millets and Sorghum: Biology and Genetic Improvement. West Sussex, United Kingdom: John Wiley & Sons

Patnaik, S., Suman, S., Ray, S. Ray, Saha, S. and Majumder, S. (2024)"The resonance of Odisha's millet mission in transforming Ragi farming in Koraput district. International Journal of Agriculture Extension and Social Development 7; (2) pp. 503-506.

Qureshi, A.A., Mo, H., Parker, L., and Peterson, D.M. (2000). Isolation and identification of novel tocotrienols from rice bran with hypocholesterolemic, antioxidant and antitumor properties. Journal of Agricultural and Food Chemistry, 48, 3130 – 3140.

Rahman, A. Pingali, P. and Mittra, B. “Food security and nutrition in rural India: Understanding state level heterogeneity” *World Food Policy*, Volume 4, Issue 2/Volume 5, Issue 1. 2019.

Riely, F. (1995). Food security indicators and framework for use in the monitoring and evaluation of food aid programmes. Food security and nutrition monitoring project. IMPACT. Arlington.

Sarita and Singh,E. (2016) Potential of millets: Nutrients composition and health benefit. Journal of Scientific and Innovative Research, 5(2,.46-50.

Sendhil R., Jyothimo J., Akhilraj, T., Sivasakthi Devi, N. Swaminathan and A. Pouchepparadjou (2023) “Status of Millets in India: Trends and Prospects. Sensitizing the Millet Farming, Consumption and Nutritional Security - Challenges and Opportunities , 15-25.

Shukla, A. Lalit A., Sharma,V., Vats,S.and Alam,A.(2015).Pearl and finger millets: the hope of food security. Applied Research Journal, 1(2), 59-66.

Srividhya, N., (2016). Cognizance and ingesting practice of small millets in Villupuram district. An examination. International Journal of Management, 7(7) , 281-287.

Stefano, P., Bhag, M., Oliver, L. K. & Elisabetta, G., (2015). Minor millets as a central element for sustainability enhanced incomes, empowerment and nutrition in rural India. Sustainability, 7(7):8904- 8933.

United Nations (2015).sustainable Development goal 2 zero hunger.

Upadhyay, R., and Palanivel, C. (2011). Challenges in Achieving Food Security in India. Iranian Journal Public Health, 31-36.

Ushakumari, S.R., S. Latha, andN.G.Malleshi. (2004).The Functional Properties of Popped, Flaked, Extruded and Roller- dried Foxtail Millet (Setariaitalica). International Journal of Food Science &Technology, 39(9): 907–915.